

In the Claims:

Please add new claims 21 and 22 as indicated below. The status of all pending claims is as follows:

1. (Previously Presented) A method for semiconductor wafer bonding, the method comprising steps of:

providing semiconductor wafers to be bonded;

cleaning surfaces of the wafers to remove particle and chemical contaminants and provide bonding surfaces comprised of the entire surfaces of the wafers;

bringing the bonding surfaces of the wafers into direct contact with each other to weakly bond the wafers to each other;

placing the wafers in a pressurization chamber;

solely through isostatic pressure, applying bonding pressure to the wafers;

heating the wafers during said step of applying bonding pressure; and

controlling and maintaining said steps of heating and applying bonding pressure for a period of time to substantially strengthen bonding between the wafers.

2. (Original) The method of claim 1, further comprising steps of:
cooling the wafers; and

removing the wafers from the pressurization chamber.

3. (Original) The method of claim 2, wherein said step of cooling is conducted while said step of controlling and maintaining continues said step of applying bonding pressure, followed by a step of depressurization.

4. (Original) The method of claim 1, wherein said step of controlling and maintaining comprises:

creating a temperature ramp and a pressure ramp to substantially strengthen bonding between the wafers.

5. (Original) The method of claim 4, wherein said step of controlling and maintaining creates the temperature ramp as a function that is independent from the pressure ramp.

6. (Original) The method of claim 1, wherein said step of heating commences prior to said step of applying pressure.

7. (Original) The method of claim 1, wherein said step of heating commences with or after said step of applying pressure.

8. (Previously Presented) The method of claim 1, wherein said step of cleaning creates hydrogen terminated surfaces at the semiconductor wafer surfaces to be bonded.

9. (Original) The method of claim 1, wherein said step of bringing creates one of a Van der Waals and Hydrogen bond.

10. (Previously Presented) The method of claim 9, wherein said step of bringing brings the semiconductor wafer surfaces to be bonded into direct contact with each other without an intervening layer.

11. (Original) The method of claim 9, wherein the wafers are of the same material.

12. (Original) The method of claim 9, wherein the wafers are of different materials.

13. (Previously Presented) The method of claim 9, wherein one of the semiconductor wafer surfaces comprises an interlayer that forms its bonding surface.

14. (Original) The method of claim 1, further comprising, immediately prior to said step of applying and said step of heating, purging the pressurization chamber.

15. (Original) The method of claim 1, wherein said step of applying bonding pressure comprises using Argon as a isostatic pressure medium.

16. (Original) The method according to claim 15, wherein the pressurization chamber comprises a hot isostatic press.

17. (Original) The method of claim 1, wherein said steps of providing, cleaning and bringing are repeated to form a plurality of weakly bonded pairs of wafers and said steps of applying, heating, and controlling and maintaining are carried out with the plurality of weakly bonded pairs of wafers simultaneously in the pressurization chamber.

18. (Original) The method of claim 1, further comprising, prior to said step of placing, loading said wafers in an unsealed container, and wherein said step of placing is carried out by placing said unsealed container in said pressurization chamber.

19. (Previously Presented) A method for semiconductor wafer bonding, the method comprising steps of:

bonding together semiconductor wafers by bringing the entire surface of semiconductor wafers together into direct contact without an intervening layer after the wafers have been prepared;

heating and pressing together wafers bonded in said step of bonding by application of isostatic pressure via a pressure ramp and temperature ramp that strengthens the bond between the wafers bonded in said step of bonding.

20. (Original) The method of claim 19, further comprising a step of controlling said heating and pressing to induce strain in at least one of said wafers.

21. (New) The method of claim 1, wherein said step of applying applies bonding pressure to the wafers without encapsulating the wafers.

22. (New) The method of claim 19, wherein said step of heating and pressing applies solely isostatic pressure to the bonded wafers, and applies pressure to the bonded wafers without encapsulating the wafers.